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(54) GAMING APPARATUS  
(71) BALLY MANUFACTURING CORPORATION  
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(74) SF  
(56) 44475/79 524709 G07F 17/34  
39332/78 G07F 17/34  
(57) Claim

1. Gaming apparatus having a known ordered series of indicia defined by the apparatus; indicia display means to display to a player of the gaming apparatus a selected one of the known ordered series of indicia; gamble control means operable by the player to select a class of indicia defined by either all the indicia of higher order or all the indicia of lower order in the known ordered series relative to the displayed selected one of the known ordered series; random selection means to select a new indicium of the known ordered series of indicia following said player's use of said gamble control means, compare means to determine if the randomly selected new indicium of the known ordered series of indicia is in the class of indicia selected by the player; and win means to produce a predetermined win response if the randomly selected new indicium of a known ordered series of indicia is in the class of indicia selected by the player.

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## COMPLETE SPECIFICATION

(ORIGINAL)

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Class

Int. Class

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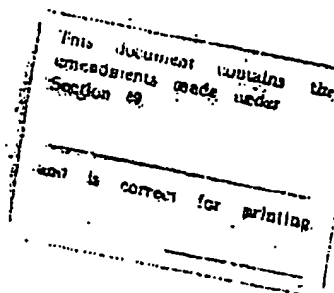
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Complete Specification for the invention entitled :  
"GAMING APPARATUS"

The following statement is a full description of this invention, including the best method of performing it known to me/us

BALLY003075

GAMING APPARATUS

The present invention concerns gaming apparatus. The invention is a especially, though not exclusively, concerned with an improvement to so-called fruit machines. Fruit machines, also known as slot machines, are well known. However, for the avoidance of doubt, a fruit machine is hereby defined for the purpose of this specification as an apparatus which in response to a playing stake from a player automatically selects at random and displays a group of two or more indicia from a predetermined collection of indicia and provides a win response of the selected and displayed group of indicia corresponds to a predetermined winning combination of the indicia. The win response is usually a predetermined value credit to the player and there may be a number of different winning combinations providing wins of different value. It is also known and common for a win response to provide a player with the option of operating various so-called play features to gamble on or improve the basic win. In most fruit machines, the indicia are provided as markings around the outer edges of three or more rotatable reels, typically having a common axis of rotation. The reels are rotated and stopped at randomly selected angular positions. At the periphery of each reel is a window exposing at least one indicium of each reel, and the exposed indicia when the reels stop constitute the selected group which may or may not be a winning combination. The windows are usually in a line parallel to the common axis of the reels and they may expose up to three adjacent indicia on each reel with a so-called win line defined at the windows identifying the group of indicia which may be a winning combination.

A number of so-called play features are well known. For example, there is the HOLD feature whereby one or more of the reels may be prevented from rotating, to

GAMING APPARATUS

ABSTRACT

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A gaming machine has a display 28 of an ordered series of indicia, e.g. numbers or playing cards. A player can press a chosen gamble button 30, 31 to select either the indicia values of higher or of lower order than the displayed. The machine then selects a new indicium at random, e.g. by microprocessor 19 and displays the new selected indicium. If this tallies with the player's gamble selection a win is awarded. The machine can be provided as a feature play of a fruit machine with the gamble selection done on an extra fruit machine reel 16.

hold the previously selected indicia, during a subsequent playing cycle of the machine. In another example, following a win, the player is offered the chance of gambling the win, double or quits. Another popular feature is the so-called Nudge feature described in British Patent No. 1292712.

The gaming apparatus of the present invention can conveniently be used as a play feature in a fruit machine. However, the gaming apparatus may also form a separate game independent of a fruit machine, or may form part of a different game.

According to the present invention, there is provided gaming apparatus having a known ordered series of indicia defined by the apparatus. indicia display means to display to a player of the gaming apparatus a selected one of the known ordered series of indicia; gamble control means operable by the player to select a class of indicia defined by either all the indicia of higher order or all the indicia of lower order in the known ordered series relative to the displayed selected one of the known ordered series; random selection means to select a new indicium of the known ordered series of indicia following said player's use of said gamble control means; compare means to determine if the randomly selected new indicium of the known ordered series of indicia is in the class of indicia selected by the player; and win means to produce a predetermined win response if the randomly selected new indicium of a known ordered series of indicia is in the class of indicia selected by the player. The ordered series of indicia in the above apparatus may comprise any series of indicia which fall in a generally known ordered series. For example, the indicia may be letters of the alphabet where A is the beginning of the series and Z is





the fresh randomly selected indicium after said gamble selection.

The display means may be arranged to display the fresh randomly selected indicium as said selected one of the indicia for a further gamble selection by the player. Then following an initial gamble by the player and random selection by the apparatus, the player may be offered a further chance to gamble starting from the freshly selected indicium.

Typically, said win response of the apparatus is a standard value credit to the player. However, any other win response may also be employed which provides an attraction to the player.

The apparatus may also produce a predetermined loss response if the fresh randomly selected indicium is one of the indicia not selected by the player, i.e. if the player guesses wrongly. The loss response may be a standard value debit to the player.

Normally, the apparatus includes an initiate control operable by the player to initiate operation of said random selection means. However, the apparatus may alternatively respond automatically to actuation by the player of said gamble selection means to initiate operation of said random selection means.

In one example, the random selection means includes a window in the apparatus, a rotatable reel behind the window having the indicia marked about an annular or circumferential surface of the reel whereby one of the indicia markings on the reel can be viewed through the window as the selected indicium depending on the angular position of the reel, means to rotate the reel and means to stop rotation of the reel at a randomly

selected angular position to make said random selection of  
the indicium viewed through the window. It can be seen that  
such a preferred embodiment lends itself to incorporation in  
a machine of the usual kind.



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Accordingly, the present invention also envisages a fruit machine as hereinbefore defined incorporating the above-described gaming apparatus and having means activating the gaming apparatus to make the apparatus available for play by the player of the fruit machine as a play feature following a normal play sequence of the fruit machine. Conveniently, said activating means is arranged to activate the apparatus only following a winning play sequence of the fruit machine. Then, if the player obtains a winning combination on the fruit machine in a normal play sequence, the player may be offered the chance of operating the gaming apparatus to increase the value of his win.

Typically, said activating means is arranged to activate the apparatus at random in response to a proportion of winning play sequences of the fruit machine. The activating means may maintain the apparatus activated for repeated further gamble selections by the player until the fresh randomly selected indicium is one of the indicia not selected by the player. In this way, the player can repeatedly increment his win until he makes a wrong guess.

An example of the present invention is now described with reference to the enclosed drawing which shows schematically a fruit machine incorporating gaming apparatus embodying the present invention.

A typical fruit machine or slot machine has a reel assembly containing the usual rotatable reels of the machine having the fruit symbols or indicia marked on the outer edges of the reels. The reel assembly usually comprises the mounting arrangements for the reels, the drive arrangement to rotate the reels together with arrangements to stop the reels as desired and usually subject to control signals from control apparatus in the machine. The reel assembly also usually contains detector means for detecting the angular positions of the reels so that at least the

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positions of the reels after they are stopped can be detected or determined, so that the symbols on the win line of the fruit machine can be known to determine whether they are a winning combination. In some arrangements the reels are rotated by an electric motor, for example, a stepping motor, and are stopped and started by stopping and starting the motor appropriately. In other arrangements, the reels are started and stopped by solenoid and ratchet arrangements.

In the example of the present invention illustrated in the figure, a reel assembly for a fruit machine is indicated generally at 10. The details of the reel assembly 10 are not shown in the figure. The reel assembly may comprise essentially any of the known types of reel assembly already employed in the fruit machine art.

The reel assembly 10 has four rotatable reels 11 to 14. Reels 11 to 13 constitute the usual fruit machine reels bearing the usual fruit symbols marked on their outer edges as at 15. The fourth reel 14 constitutes a feature reel of this fruit machine enabling a play feature to be played on the machine in accordance with this embodiment of the invention. The reel 14 has indicia marked about its outer edge as at 16. The indicia 16 are all members of an ordered series of indicia such that a player of the machine can immediately recognise whether one indicium of the series is of a higher or lower order than another indicium in the series. In the illustrated example, the indicia are simply numbers. It is not essential for the numbers 16 to be arranged about the reel 14 in numerical order, nor is it essential that each number is different from every other number on the reel 14. It is only necessary that there are several different numbers located about the periphery of the reel 14. It is however preferable that the numbers 16 on the reel form a continuous series with-

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out any gaps, for example, all the numbers from 1 to 13, and also that each number appears on the reel 14 an equal number of times. This ensures that with random stopping of the reel 14, the number 16 appearing behind the win line of the machine as will be explained later is randomly selected from the series.

Instead of numbers 16 the indicia on the reel 14 could be letters of the alphabet or playing card values.

10 The reel assembly 10 is located in the fruit machine behind a window 17 in a front panel of the machine so that, in the usual way, at least one indicium of each of the reels can be seen through the window when the reels stop. Commonly, the window 17 is made sufficiently big so  
15 that three or more adjacent indicia from each reel can be viewed through the window, in which case a win line 18 is marked on or adjacent the window to identify the indicia on the stopped reels which are to be considered for a winning combination. In the present example, the win line 18  
20 also identifies the number 16 on the reel 14 which is randomly selected by operation of the machine as will be explained.

The normal game sequence of the fruit machine in the present example can operate in any known way in the  
25 art. The overall control of operation of the fruit machine in the illustrated example is maintained by a microprocessor system comprising a microprocessor 19 connected in data communication with a random access memory RAM 20 and a read only memory ROM 21 by means of data buses 22. Data input  
30 to the microprocessor system, for example, from switches operated by a player of the machine, is controlled via an input/output interface unit 23 also connected to the data bus 22. The interconnection and design of the microprocessor system comprising the microprocessor 19 RAM 20 ROM  
35 21 and interface unit 23 is simply a matter of design.

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fully within the capability of the experienced engineer working in this field and forms no part of the present invention. Furthermore, the detailed programming of the microprocessor system is also a matter for the experienced design engineer and programmer. In a typical standard game cycle of a fruit machine, the microprocessor responds to input signals indicating a player has inserted sufficient coins or tokens into the machine to have credit for a game to enable an initiate button. When the player presses the initiate button on the fruit machine, the microprocessor responds by sending signals via the interface unit 23 to the reel assembly 10 along a line 24 to initiate spinning of at least the reels 11 to 13 of the machine. The reels 11 to 13 may be stopped by autonomous action of the reel assembly 10 but, more typically, they are stopped also by specific control from the microprocessor. Once the reels 11 to 13 are stopped, the angular positions of the stopped reels are determined and data defining the stop positions supplied to the microprocessor via the interface unit 23 along a line 25. The microprocessor 19 then identifies the symbols on the reels 11 to 13 appearing at the win line 18, typically by reference to data in the ROM 21, and further determines whether these symbols constitute a winning combination again by reference to data in the ROM 21. If a win is indicated, the microprocessor provides signals again via the interface unit to operate an appropriate credit or pay-out to the player by a pay-out unit 26.

In the present example embodying this invention, following a win combination of the stopped reels 11 to 13 as determined by the microprocessor 19, the microprocessor 19 then enables a feature play before initiating the pay-out. This may be indicated to the player of the machine by a flashing light 27 on the front panel of the machine controlled by the microprocessor via the interface unit 23.

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At the same time, the microprocessor 19 selects one of the numbers 16 of the reel 14 and displays this number on a display 28 which is controlled by data on a line 29 from the interface unit 23. Then, on inspecting the number displayed by the display 28, the player decides whether to gamble that a future random selection will produce a number from the series on the reel 14 either higher or lower than that displayed on the display 28. The fruit machine will normally have clearly visible instructions on its front panel making it clear to the player the range of numbers from which the selection will be made. For example, if the range is from the numbers 1 to 13, and the number displayed on the display 28 is number 9, then the player might consider it most likely that a future random selection would produce a number lower than number 9 from the series. The player would indicate the selection by pressing a button 30 marked LOWER. If on the other hand the player considered it more likely the selection would produce a higher number, he would press a button 31 marked HIGHER. The player's selection is supplied to the microprocessor 19 along lines 32 and 33 via the interface unit 23. Following selection by pressing one of the buttons 30 and 31 the player initiates the automatic random selection by the machine by pressing an INITIATE button 34 which signals to the microprocessor along a line 35 via the interface unit 23. The microprocessor 19 responds by instructing the reel assembly 10, along the line 24, to spin the reel 14 and subsequently stop the reel at a randomly selected angular position. The random selection of the machine is then indicated by the number 16 of the reel 14 appearing behind the win line 18.

The position of the reel 14 after stopping is supplied to the microprocessor 19 along the lines 25 and the microprocessor 19 determines the number 16 on the win line 18 by comparison with data in ROM 21 and compares

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this number with the number being displayed on the display 28. If the comparison agrees with the HIGHER/LOWER selection by the player, then the microprocessor 19 provides a win response by instructing the credit/debit pay-out unit 26, via the interface unit 23 to credit the player with a standard value.

In the present example, the microprocessor 19 is programmed also to maintain the availability of the play feature following a winning selection by a player so that the player can subsequently gamble again. Then, the microprocessor 19 automatically changes the number displayed on the display 28 so as to correspond with the randomly selected number from the reel 14 on the win line 12. Thus, the number in the display 28 is changed automatically following a correct or winning selection by the player. However, if the player makes a losing selection, the microprocessor 19 responds by discontinuing the availability of the play feature. The original value on the display 28 is then left to enable the player to compare it virtually with the random selection on the reel 14.

There are various modifications of the game feature embodying this invention. It may be preferred to provide the feature as a "no loss" feature so that when the feature is offered, the player receives a standard credit following each correct selection, but following a wrong selection, the feature is simply discontinued and the player has the option of proceeding with a further coin play sequence of the fruit machine. In this arrangement, it will normally be desirable to provide a maximum number of repeated feature plays following successive correct selections by a player to limit the maximum credit available on a particular sequence. For example, a player may be able to make correct selections up to a maximum of ten successive times after which the play feature is discontinued.

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atically discontinues availability of the feature so that the game proceeds to a normal cycle.

In another arrangement, the microprocessor may  
5 arrange to provide a debit of a standard value against a player following a wrong selection by the player.

Furthermore, it may be desirable to limit the number of times upon which the feature is made available following a winning combination of the normal fruit machine  
10 play cycle. Thus, the play feature embodying the present invention is made available only at random following a proportion of winning combinations.

The example of this invention described with reference to the accompanying drawing includes a micro-  
15 processor system. However, it should be apparent that other ways of engineering the present invention are possible and within the ability of the design engineer. For example, the microprocessor system may be replaced by an electro-mechanical or electronic logic system designed  
20 specifically for the purpose intended.

In playing the game feature described above, it will be apparent that it is possible the randomly selected number from the reel 14 may be equal to the number in the display 28. The way in which the microprocessor 19 is  
25 arranged to respond to this situation is for the designer to decide. The microprocessor may treat such an identical selection as either a win or as a lose. In the "no lose" example described above, it may be preferable to programme the microprocessor 19 to respond to an identical selection  
30 by discontinuing availability of the feature. However, in other arrangements, the microprocessor may be programmed to respond to an identical selection with a bonus win, perhaps at the same time discontinuing further availability.

The example of the present invention illustrated in the  
35 drawing, employs a reel assembly 16 with rotatable reels

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as common in fruit machines. However, other techniques of making a random selection of the indicia of the ordered series may be used. For example, the fruit machine may  
5 have a television-type screen on which the normal fruit symbols are displayed subject to the control of electronic circuitry. Then, the random selection may take place purely in the circuitry of the machine with the selected indicium being displayed on the screen.

10 Furthermore, although in the present example, an embodiment of the invention has been described as a play feature of a normal fruit machine, it will be appreciated that other embodiments of the present invention are possible quite independent from fruit machines. The prin-  
15 ciples of the game apparatus of the present invention can be embodied separately in appropriate apparatus or as additional features in different game machines.

The claims defining the invention are as follows:

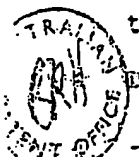
1. Gaming apparatus having a known ordered series of indicia defined by the apparatus; indicia display means to display to a player of the gaming apparatus a selected one of the known ordered series of indicia; gamble control means operable by the player to select a class of indicia defined by either all the indicia of higher order or all the indicia of lower order in the known ordered series relative to the displayed selected one of the known ordered series; random selection means to select a new indicium of the known ordered series of indicia following said player's use of said gamble control means; compare means to determine if the randomly selected new indicium of the known ordered series of indicia is in the class of indicia selected by the player; and win means to produce a predetermined win response if the randomly selected new indicium of a known ordered series of indicia is in the class of indicia selected by the player.

2. Gaming apparatus as claimed in claim 1 wherein means are provided to display the fresh randomly selected indicium after said gamble selection.

3. Gaming apparatus as claimed in claim 1 or claim 2 wherein said display means is arranged to display the fresh randomly selected indicium as said selected one of the indicia for a further gamble selection by the player.

4. Gaming apparatus as claimed in any preceding claim wherein said win response is a standard value credit to the player.

5. Gaming apparatus as claimed in any preceding claim wherein said win means produces a predetermined lose response if the fresh randomly selected indicium is one of the indicia not



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selected by the player.

6. Gaming apparatus as claimed in claim 5 wherein said  
lose response is a standard value debit to the player.

7. Gaming apparatus as claimed in any preceding claim  
and including an initiate control operable by the

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player to initiate operation of said random selection means.

8. Gaming apparatus as claimed in any preceding claim wherein said random selection means includes a window in the apparatus, a rotatable reel behind the window having the indicia marked about an annular or circumferential surface of the reel whereby one of the indicia markings on the reel can be viewed through the window as the selected indicium depending on the angular position of the reel, means to stop rotation of the reel at a randomly selected angular position to make said random selection of the indicium viewed through the window.

9. A fruit machine, as hereinbefore defined incorporating a gaming apparatus as claimed in any preceding claim and having means activating the gaming apparatus to make the apparatus available for play by the player of the fruit machine as a play feature following a normal play sequence of the fruit machine.

10. A fruit machine as claimed in claim 9 wherein said activating means activates the apparatus only following a winning play sequence of the fruit machine.

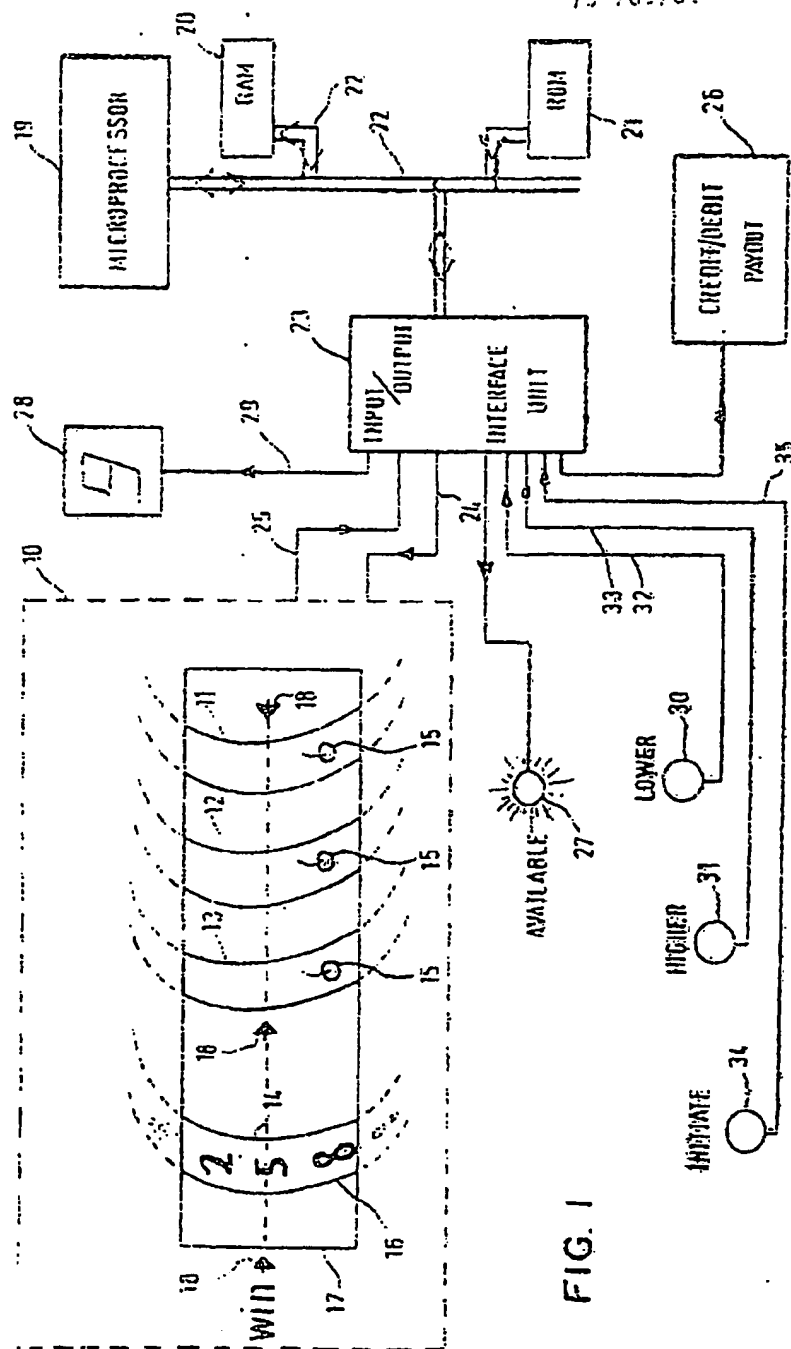
11. A fruit machine as claimed in claim 10 wherein said activating means is arranged to activate the apparatus at random in response to a proportion of winning play sequences of the fruit machine.

12. A fruit machine as claimed in any of claims 9 to 11, as dependent from claim 3, wherein said activating means maintains the apparatus activated for repeated further gamble selections by the player until the fresh randomly selected indicium is one of the indicia not selected by the player.

13. A fruit machine substantially as hereinbefore described with reference to and as illustrated in any of the accompanying drawings.

Figure 1. The effect of the number of trials on the number of correct responses. The number of correct responses was plotted against the number of trials for each condition. The number of correct responses increased with the number of trials for all conditions. The number of correct responses was highest for the condition with the highest number of trials (10 trials) and lowest for the condition with the lowest number of trials (2 trials).

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(54) GAMING APPARATUS

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(57) Claim

1. Gaming apparatus having a known ordered series of indicia defined by the apparatus; indicia display means to display to a player of the gaming apparatus a selected one of the known ordered series of indicia; gamble control means operable by the player to select a class of indicia defined by either all the indicia of higher order or all the indicia of lower order in the known ordered series relative to the displayed selected one of the known ordered series; random selection means to select a new indicium of the known ordered series of indicia following said player's use of said gamble control means; compare means to determine if the randomly selected new indicium of the known ordered series of indicia is in the class of indicia selected by the player; and win means to produce a predetermined win response if the randomly selected new indicium of a known ordered series of indicia is in the class of indicia selected by the player.

## COMPLETE SPECIFICATION

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Complete Specification for the invention entitled :

"GAMING APPARATUS"

The following statement is a full description of this invention, including the best method of performing it known to me/us.

GAMING APPARATUS

The present invention concerns gaming apparatus. The invention is a especially, though not exclusively, concerned with an improvement to so-called fruit machines. 5 Fruit machines, also known as slot machines, are well known. However, for the avoidance of doubt, a fruit machine is hereby defined for the purpose of this specification as an apparatus which in response to a playing stake from a player 10 automatically selects at random and displays a group of two or more indicia from a predetermined collection of indicia and provides a win response of the selected and displayed group of indicia corresponds to a predetermined winning combination of the indicia. The win response is 15 usually a predetermined value credit to the player and there may be a number of different winning combinations providing wins of different value. It is also known and common for a win response to provide a player with the option of operating various so-called play features to gamble 20 on or improve the basic win. In most fruit machines, the indicia are provided as markings around the outer edges of three or more rotatable reels, typically having a common axis of rotation. The reels are rotated and stopped at randomly selected angular positions. At the periphery of 25 each reel is a window exposing at least one indicium of each reel, and the exposed indicia when the reels stop constitute the selected group which may or may not be a winning combination. The windows are usually in a line parallel to the common axis of the reels and they may expose 30 up to three adjacent indicia on each reel with a so-called win line defined at the windows identifying the group of indicia which may be a winning combination.

A number of so-called play features are well known. For example, there is the HOLD feature whereby one 35 or more of the reels may be prevented from rotating, to



GAMING APPARATUS

ABSTRACT

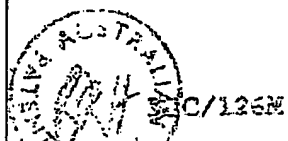
A gaming machine has a display 28 of an ordered series of indicia, e.g. numbers or playing cards. A  
5 player can press a chosen gamble button 30, 31 to select either the indicia values of higher or of lower order than the displayed. The machine then selects a new indicium at random, e.g. by microprocessor 19 and displays the new selected indicium. If this tallies with the player's  
10 gamble selection a win is awarded. The machine can be provided as a feature play of a fruit machine with the gamble selection done on an extra fruit machine reel 16.

hold the previously selected indicia, during a subsequent playing cycle of the machine. In another example, following a win, the player is offered the chance of gambling the win, double or quits. Another popular feature is the so-called Nudge feature described in British Patent No. 1292712.

The gaming apparatus of the present invention can conveniently be used as a play feature in a fruit machine. However, the gaming apparatus may also form a separate game independent of a fruit machine, or may form part of a different game.

According to the present invention, there is provided gaming apparatus having a known ordered series of indicia defined by the apparatus. Indicia display means to display to a player of the gaming apparatus a selected one of the known ordered series of indicia; gamble control means operable by the player to select a class of indicia defined by either all the indicia of higher order or all the indicia of lower order in the known ordered series relative to the displayed selected one of the known ordered series; random selection means to select a new indicium of the known ordered series of indicia following said player's use of said gamble control means; compare means to determine if the randomly selected new indicium of the known ordered series of indicia is in the class of indicia selected by the player; and win means to produce a predetermined win response if the randomly selected new indicium of a known ordered series of indicia is in the class of indicia selected by the player. The ordered series of indicia in the above apparatus may comprise any series of indicia which fall in a generally known ordered series. For example, the indicia may be letters of the alphabet where A is the beginning of the series and Z is

the end of the series. Alternatively, the indicia may be a series of numbers, or they may be values of playing cards. The gaming apparatus operates by permitting the player to guess whether the indicium to be selected at random will be of higher value or lower value in the ordered series than the indicium on display. If the player guesses correctly, then the apparatus provides a win response. It is normally desirable that means are provided to display



the fresh randomly selected indicium after said gamble selection.

The display means may be arranged to display the fresh randomly selected indicium as said selected one of the indicia for a further gamble selection by the player. Then following an initial gamble by the player and random selection by the apparatus, the player may be offered a further chance to gamble starting from the freshly selected indicium.

Typically, said win response of the apparatus is a standard value credit to the player. However, any other win response may also be employed which provides an attraction to the player.

The win means may also produce a predetermined lose response if the fresh randomly selected indicium is one of the indicia not selected by the player, i.e. if the player guesses wrongly. The lose response may be a standard value debit to the player.

Normally, the apparatus includes an initiate control operable by the player to initiate operation of said random selection means. However, the apparatus may alternatively respond automatically to actuation by the player of said gamble selection means to initiate operation of said random selection means.

In one example, the random selection means includes a window in the apparatus, a rotatable reel behind the window having the indicia marked about an annular or circumferential surface of the reel whereby one of the indicia markings on the reel can be viewed through the window as the selected indicium depending on the angular position of the reel, means to rotate the reel and means to stop rotation of the reel at a randomly

selected angular position to make said random selection of the indicium viewed through the window. It can be seen that such a preferred embodiment lends itself to incorporation in a machine of the usual kind.

Accordingly, the present invention also envisages a fruit machine as hereinbefore defined incorporating the above-described gaming apparatus and having means activating the gaming apparatus to make the apparatus available for play by the player of the fruit machine as a play feature following a normal play sequence of the fruit machine. Conveniently, said activating means is arranged to activate the apparatus only following a winning play sequence of the fruit machine. Then, if the player obtains a winning combination on the fruit machine in a normal play sequence, the player may be offered the chance of operating the gaming apparatus to increase the value of his win.

Typically, said activating means is arranged to activate the apparatus at random in response to a proportion of winning play sequences of the fruit machine. The activating means may maintain the apparatus activated for repeated further gamble selections by the player until the fresh randomly selected indicium is one of the indicia not selected by the player. In this way, the player can repeatedly increment his win until he makes a wrong guess.

An example of the present invention is now described with reference to the enclosed drawing which shows schematically a fruit machine incorporating gaming apparatus embodying the present invention.

A typical fruit machine or slot machine has a reel assembly containing the usual rotatable reels of the machine having the fruit symbols or indicia marked on the outer edges of the reels. The reel assembly usually comprises the mounting arrangements for the reels, the drive arrangement to rotate the reels together with arrangements to stop the reels as desired and usually subject to control signals from control apparatus in the machine. The reel assembly also usually contains detector means for detecting the angular positions of the reels so that at least the

positions of the reels after they are stopped can be detected or determined, so that the symbols on the win line of the fruit machine can be known to determine whether they are a winning combination. In some arrangements the reels are rotated by an electric motor, for example, a stepping motor, and are stopped and started by stopping and starting the motor appropriately. In other arrangements, the reels are spun and stopped by solenoid and ratchet arrangements.

In the example of the present invention illustrated in the figure, a reel assembly for a fruit machine is indicated generally at 10. The details of the reel assembly 10 are not shown in the figure. The reel assembly may comprise essentially any of the known types of reel assembly already employed in the fruit machine art.

The reel assembly 10 has four rotatable reels 11 to 14. Reels 11 to 13 constitute the usual fruit machine reels having the usual fruit symbols marked on their outer edges as at 15. The fourth reel 14 constitutes a feature reel of the fruit machine enabling a play feature to be played on the machine in accordance with this embodiment of the invention. The reel 14 has indicia marked about its outer edge as at 16. The indicia 16 are all members of an ordered series of indicia such that a player of the machine can immediately recognise whether one indicium of the series is of a higher or lower order than another indicium in the series. In the illustrated example, the indicia are simply numbers. It is not essential for the numbers 16 to be arranged about the reel 14 in numerical order, nor is it essential that each number is different from every other number on the reel 14. It is only necessary that there are several different numbers located about the periphery of the reel 14. It is however preferable that the numbers 16 on the reel form a continuous series with-

out any gaps, for example, all the numbers from 1 to 13, and also that each number appears on the reel 14 an equal number of times. This ensures that with random stopping of the reel 14, the number 16 appearing behind the win line of the machine as will be explained later is randomly selected from the series.

Instead of numbers 16 the indicia on the reel 14 could be letters of the alphabet or playing card values.

10 The reel assembly 10 is located in the fruit machine behind a window 17 in a front panel of the machine so that, in the usual way, at least one indicium of each of the reels can be seen through the window when the reels stop. Commonly, the window 17 is made sufficiently big so  
15 that three or more adjacent indicia from each reel can be viewed through the window, in which case a win line 18 is marked on or adjacent the window to identify the indicia on the stopped reels which are to be considered for a winning combination. In the present example, the win line 18  
20 also identifies the number 16 on the reel 14 which is randomly selected by operation of the machine as will be explained.

The normal game sequence of the fruit machine in the present example can operate in any known way in the  
25 art. The overall control of operation of the fruit machine in the illustrated example is maintained by a microprocessor system comprising a microprocessor 19 connected in data communication with a random access memory RAM 20 and a read only memory ROM 21 by means of data buses 22. Data input  
30 to the microprocessor system, for example, from switches operated by a player of the machine, is controlled via an input/output interface unit 23 also connected to the data bus 22. The interconnection and design of the microprocessor system comprising the microprocessor 19 RAM 20 ROM  
35 21 and interface unit 23 is simply a matter of design.



fully within the capability of the experienced engineer working in this field and forms no part of the present invention. Furthermore, the detailed programming of the microprocessor system is also a matter for the experienced design engineer and programmer. In a typical standard game cycle of a fruit machine, the microprocessor responds to input signals indicating a player has inserted sufficient coins or tokens into the machine to have credit for a game to enable an initiate button. When the player presses the initiate button on the fruit machine, the microprocessor responds by sending signals via the interface unit 23 to the reel assembly 10 along a line 24 to initiate spinning of at least the reels 11 to 13 of the machine. The reels 11 to 13 may be stopped by autonomous action of the reel assembly 10 but, more typically, they are stopped also by specific control from the microprocessor. Once the reels 11 to 13 are stopped, the angular positions of the stopped reels are determined and data defining the stop positions supplied to the microprocessor via the interface unit 23 along a line 25. The microprocessor 19 then identifies the symbols on the reels 11 to 13 appearing at the win line 18, typically by reference to data in the ROM 21, and further determines whether these symbols constitute a winning combination again by reference to data in the ROM 21. If a win is indicated, the microprocessor provides signals again via the interface unit to operate an appropriate credit or pay-out to the player by a pay-out unit 26.

In the present example embodying this invention, following a win combination of the stopped reels 11 to 13 as determined by the microprocessor 19, the microprocessor 19 then enables a feature play before initiating the pay-out. This may be indicated to the player of the machine by a flashing light 27 on the front panel of the machine controlled by the microprocessor via the interface unit 22.

At the same time, the microprocessor 19 selects one of the numbers 16 of the reel 14 and displays this number on a display 28 which is controlled by data on a line 29 from the interface unit 23. Then, on inspecting the number displayed by the display 28, the player decides whether to gamble that a future random selection will produce a number from the series on the reel 14 either higher or lower than that displayed on the display 28. The fruit machine will normally have clearly visible instructions on its front panel making it clear to the player the range of numbers from which the selection will be made. For example, if the range is from the numbers 1 to 13, and the number displayed on the display 28 is number 9, then the player might consider it most likely that a future random selection would produce a number lower than number 9 from the series. The player would indicate the selection by pressing a button 30 marked LOWER. If on the other hand the player considered it more likely the selection would produce a higher number, he would press a button 31 marked HIGHER. The player's selection is supplied to the microprocessor 19 along lines 32 and 33 via the interface unit 23. Following selection by pressing one of the buttons 30 and 31 the player initiates the automatic random selection by the machine by pressing an INITIATE button 34 which signals to the microprocessor along a line 35 via the interface unit 23. The microprocessor 19 responds by instructing the reel assembly 10, along the line 24, to spin the reel 14 and subsequently stop the reel at a randomly selected angular position. The random selection of the machine is then indicated by the number 16 of the reel 14 appearing behind the win line 12.

The position of the reel 14 after stopping is supplied to the microprocessor 19 along the lines 25 and the microprocessor 19 determines the number 16 on the win line 16 by comparison with data in ROM 21 and compares

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this number with the number being displayed on the display 26. If the comparison agrees with the HIGHER/LOWER selection by the player, then the microprocessor 19 provides a win response by instructing the credit/debit pay-out unit 25, via the interface unit 23 to credit the player with a standard value.

In the present example, the microprocessor 19 is programmed also to maintain the availability of the play feature following a winning selection by a player so that the player can subsequently gamble again. Then, the microprocessor 19 automatically changes the number displayed on the display 28 so as to correspond with the randomly selected number from the reel 14 on the win line 18. Thus, the number in the display 28 is changed automatically following a correct or winning selection by the player. However, if the player makes a losing selection, the microprocessor 19 responds by discontinuing the availability of the play feature. The original value on the display 28 is then left to enable the player to compare it visually with the random selection on the reel 14.

There are various modifications of the game feature embodying this invention. It may be preferred to provide the feature as a "no lose" feature so that when the feature is offered, the player receives a standard credit following each correct selection, but following a wrong selection, the feature is simply discontinued and the player has the option of proceeding with a further normal play sequence of the fruit machine. In this arrangement, it will normally be desirable to provide a maximum number of repeated feature plays following successive correct selections by a player to limit the maximum credit available on a particular sequence. For example, a player may be able to make correct selections up to a maximum of ten successive times after which the play feature 19 ends.

matically discontinues availability of the feature so that the game proceeds to a normal cycle.

5 In another arrangement, the microprocessor may arrange to provide a debit of a standard value against a player following a wrong selection by the player.

10 Furthermore, it may be desirable to limit the number of times upon which the feature is made available following a winning combination of the normal fruit machine play cycle. Thus, the play feature embodying the present invention is made available only at random following a proportion of winning combinations.

15 The example of this invention described with reference to the accompanying drawing includes a microprocessor system. However, it should be apparent that other ways of engineering the present invention are possible and within the ability of the design engineer. For example, the microprocessor system may be replaced by an electro-mechanical or electronic logic system designed specifically for the purpose intended.

20 In playing the game feature described above, it will be apparent that it is possible the randomly selected number from the reel 14 may be equal to the number in the display 28. The way in which the microprocessor 19 is arranged to respond to this situation is for the designer to decide. The microprocessor may treat such an identical selection as either a win or as a lose. In the "no lose" example described above, it may be preferable to programme the microprocessor 19 to respond to an identical selection by discontinuing availability of the feature. However, in 25 other arrangements, the microprocessor may be programmed to respond to an identical selection with a bonus win, perhaps at the same time discontinuing further availability.

30 The example of the present invention illustrated in the drawing, employs a reel assembly 10 with rotatable reels

as common in fruit machines. However, other techniques of making a random selection of the indicia of the ordered series may be used. For example, the fruit machine may  
5 have a television-type screen on which the normal fruit symbols are displayed subject to the control of electronic circuitry. Then, the random selection may take place purely in the circuitry of the machine with the selected indicium being displayed on the screen.

10 Furthermore, although in the present example, an embodiment of the invention has been described as a play feature of a normal fruit machine, it will be appreciated that other embodiments of the present invention are possible quite independent from fruit machines. The prin-  
15 ciples of the game apparatus of the present invention can be embodied separately in appropriate apparatus or as additional features in different game machines.

The claims defining the invention are as follows:

1. Gaming apparatus having a known ordered series of indicia defined by the apparatus; indicia display means to display to a player of the gaming apparatus a selected one of the known ordered series of indicia; gamble control means operable by the player to select a class of indicia defined by either all the indicia of higher order or all the indicia of lower order in the known ordered series relative to the displayed selected one of the known ordered series; random selection means to select a new indicium of the known ordered series of indicia following said player's use of said gamble control means; compare means to determine if the randomly selected new indicium of the known ordered series of indicia is in the class of indicia selected by the player; and win means to produce a predetermined win response if the randomly selected new indicium of a known ordered series of indicia is in the class of indicia selected by the player.

2. Gaming apparatus as claimed in claim 1 wherein means are provided to display the fresh randomly selected indicium, after said gamble selection.

3. Gaming apparatus as claimed in claim 1 or claim 2 wherein said display means is arranged to display the fresh randomly selected indicium as said selected one of the indicia for a further gamble selection by the player.

4. Gaming apparatus as claimed in any preceding claim wherein said win response is a standard value credit to the player.

5. Gaming apparatus as claimed in any preceding claim wherein said win means produces a predetermined lose response if the fresh randomly selected indicium is one of the indicia not



selected by the player.

6... Gaming apparatus as claimed in claim 5 wherein said  
lose response is a standard value debit to the player.

7. Gaming apparatus as claimed in any preceding claim and including an initiate control operable by the

[illegible]

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player to initiate operation of said random selection means.

8. Gaming apparatus as claimed in any preceding claim wherein said random selection means includes a window in the apparatus, a rotatable reel behind the window having the indicia marked about an annular or circumferential surface of the reel whereby one of the indicia markings on the reel can be viewed through the window as the selected indicium depending on the angular position of the reel, means to stop rotation of the reel at a randomly selected angular position to make said random selection of the indicium viewed through the window.

9. A fruit machine, as hereinbefore defined incorporating a gaming apparatus as claimed in any preceding claim and having means activating the gaming apparatus to make the apparatus available for play by the player of the fruit machine as a play feature following a normal play sequence of the fruit machine.

10. A fruit machine as claimed in claim 9 wherein said activating means activates the apparatus only following a winning play sequence of the fruit machine.

11. A fruit machine as claimed in claim 10 wherein said activating means is arranged to activate the apparatus at random in response to a proportion of winning play sequences of the fruit machine.

12. A fruit machine as claimed in any of claims 9 to 11, as dependent from claim 3, wherein said activating means maintains the apparatus activated for repeated further gamble selections by the player until the fresh randomly selected indicium is one of the indicia not selected by the player.

13. A fruit machine substantially as hereinbefore described with reference to and as illustrated in any of the accompanying drawings.



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DATED this TWENTY-NINTH day of SEPTEMBER, 1961

BALLY MANUFACTURING CORPORATION

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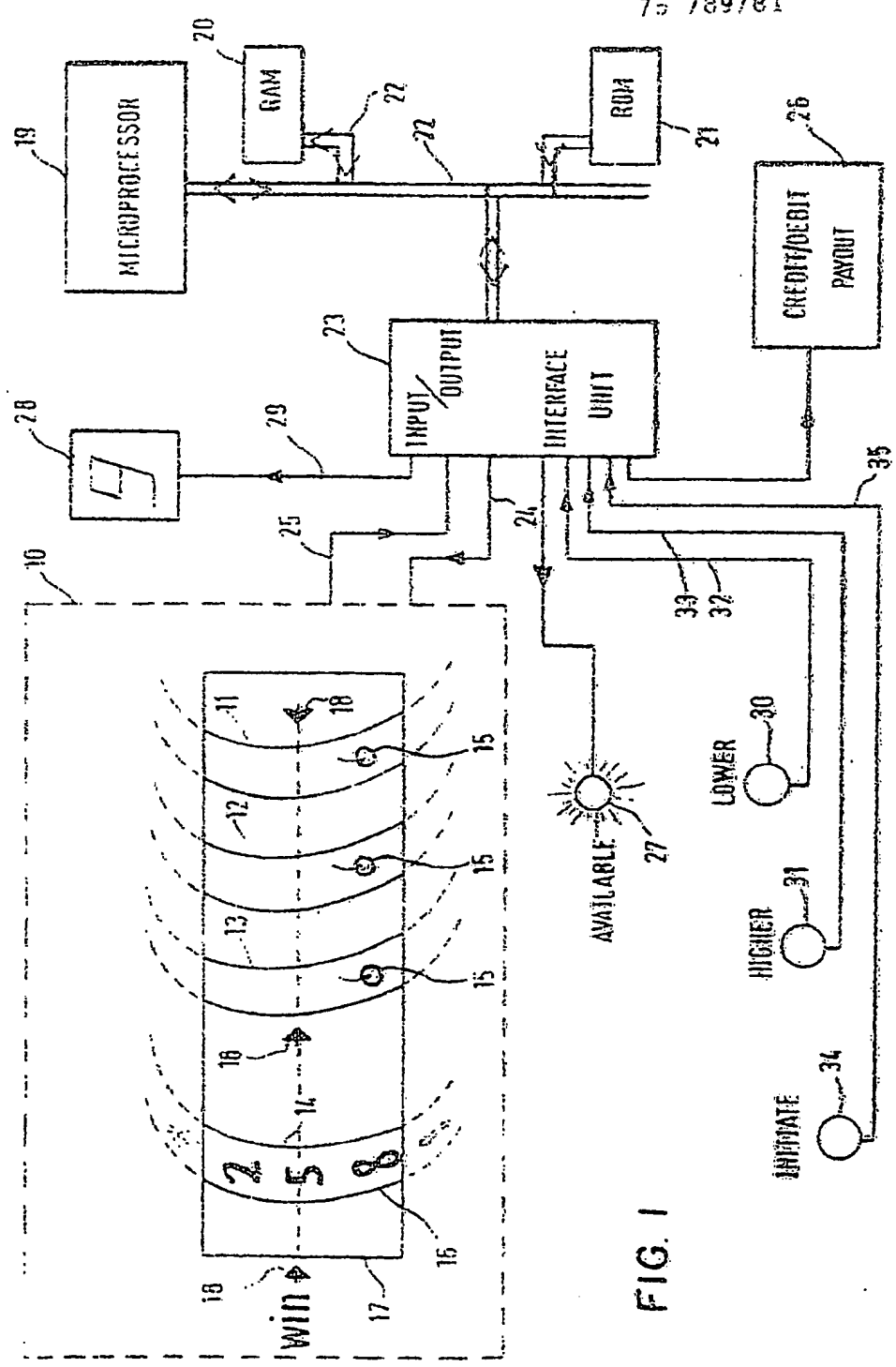


FIG. 1

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